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RESEARCH ACTIVITIES

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PLANT INDUSTRY STATION, BELTSVILLE, MD.

APRIL 1949

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H. A. Jones Offers Plan for Improving Egyptian Onion Crop

The small, flat, yellow, pungent Egyptian onion--Giza No. 6--can be improved to the benefit of both the Nile Valley grower and the European consumer in the opinion of Dr. H. A. Jones, F&VC&D.

Dr. Jones has recently returned from a month's stay in Egypt where as guest of the Minister of Agriculture, he studied all phases of onion production from breeding through harvesting and marketing. The onion is the country's third largest export crop, exceeded only by cotton and rice. It is sold as far north as the Scandanavian countries and as far west as Central America.

Chief needs of the Egyptian onion industry, according to Dr. Jones are (1) onions of more uniform size, color, and high quality; (2) increased and more stable yields of marketable onions and of seed of improved strains; and (3) handling practices that reduce injury and spoilage.

To meet these needs, he suggests a double-barreled program of breeding and of improved harvesting methods. He has advised Egyptian plant scientists to improve present strains by making a synthetic variety. This can be done in 6 or 8 years through the selection of superior seedlings, inbreeding these to get rid of offtypes, and then massing the selections to regain hybrid vigor. It will take longer to develop hybrid onion varieties for which he has provided the breeders with foundation stocks.

The good keeping quality is one of the chief advantages of the Egyptian onion. This can be improved, Dr. Jones believes, by a longer curing period after harvest than is now generally used and by provision for better aeration in shipping.

Dr. Jones spent most of his time in Cairo, where he conferred with the Minister of Agriculture and other officials on his staff and members of the faculty of Faoud First University. He made a trip to Shandaweel, in the heart of the big onion district 400 miles up the Nile Valley, and also to Alexandria, where he inspected grading and boat-loading practices. A number of the plant scientists with whom he worked in Egypt are former students of Dr. Jones when he was on the faculty of the University of California.

During his stay in Egypt Dr. Jones collected a large amount of vegetable seed on native types that offer promising material for plant breeders in this country.

Chestnut Version of Johnny Appleseed Story

Dr. Jesse Diller, FP, has taken a tip from Johnny Appleseed in his choice of a method to establish promising blight-resistant Chinese chestnuts into woodlands of eastern United States.

Each spring for the past 4 years he has set aside several hundred seed to be given free--5 seeds each--to selected farmers who agreed to report on the seedlings.

The seeds are of a strain introduced by the Department from Nanking, of the fastest growing of the Chinese chestnuts and produces good-flavored nuts in about 10 years. The pathologists believe it has value for wildlife and various forest products when planted on proper sites.

Distributing the chestnut seeds in the course of other field activities, Dr. Diller stopped along the highway at 35- to 50-mile intervals at farmsteads where good stands of trees, shrubs, and flowers have usually indicated willing cooperators.

He has offered the seeds free to the farmer on his agreement to plant them immediately--that day, because chestnut seeds do not keep well. He has requested the farmer to plant the seeds in fertile garden soil, somewhere near the house where the seedlings can be watched and where the presence of a farm dog or cat will discourage rodents. These have been the bane in direct plantings in the woods, where they have devoured all but 2 or 3 percent of the seeds.

This Johnny Appleseed method has given good results. Four out of five of the farmers have obtained seedlings, some getting a seedling for each seed planted. They have been advised to transplant the seedlings when they reach 1-1/2 to 2 feet in height. The seedlings should be planted in pairs. Chestnuts require cross-pollination to bear well and deep, fertile soil near the farm buildings or in woodland openings. The trees around the house will serve as a source of supply of seed of a superior strain for woodland plantings. It is a method for county agents and others to try out in getting farmers initially interested in planting forest trees and in woodland improvement.

Research Conference for Automotive Officials

Twenty visitors representing a cross section of the management and engineering staff of the Dearborn Motors Corp., Detroit, attended a 3-day conference in Washington and at Beltsville in March.

The conference was designed to show the integration of Department research in attacking farm machinery and related problems. It was arranged by A. W. Turner and members of the Division of Farm Machinery.

In Washington the group met Undersecretary Loveland, Dr. P. V. Cardon of ARA, and other key administrative officials. During their 2 days at Beltsville they heard talks by Dr. R. M. Salter, 17 other scientists from this Bureau, and Dr. Lane Moore of BDI. They inspected the agricultural engineering projects located at the Center.

Bureau Teams With Brazil to Attack Tristeza

Scientists of the Bureau are already doing considerable work of the type called for by President Truman in Point IV of the Inaugural address--they export of scientific know-how to other parts of the world.

Research on the cause and control of a serious virus disease of citrus fruit on sour-orange rootstocks is a case in point.

For the past 3 years the Division of Fruit and Vegetable Crops and Diseases has assigned a staff member to work with scientists at the Instituto Agronomico at Campinas, Brazil, in finding a solution to this problem. Dr. Theodore J. Grant has been in charge since January 1948. He succeeded Dr. Carlyle W. Bennett, who did the preliminary work.

The Brazilians have named the disease tristeza, meaning sadness, and that is the name Bureau workers also use for it. First observed in Argentina about 1930 and then in Brazil in 1937, the disease now occurs in most of the commercial citrus districts of Argentina, Brazil, and Uruguay. It has spread through Brazilian orchards like an epidemic. Similar disorders have been reported from South Africa, Java, Australia, and southern California.

Results of the cooperative work in Brazil demonstrate conclusively that the disease is caused by a virus, which can be transmitted by an insect vector--the black citrus aphid--and by budding.

Since a high percentage of the susceptible orange trees of Brazil have been destroyed or rendered of little value, the problem of control there is now largely one of replanting with resistant varieties. Dr. Grant and the Brazilian scientists are testing 191 citrus varieties from Florida, Texas, and California, and 51 varieties from Brazil for resistance.

Rootstocks of sweet orange, mandarin, and tangerine varieties have proved tristeza-tolerant for scions of various sweet orange and grapefruit varieties even though the plants have been inoculated and are carriers of the tristeza virus. Nor does sour orange tested as scion over sour orange rootstock show symptoms of the disease. Results indicate that infected buds can be used on tolerant stocks to establish new orchards. This is an advantage because of the expense required in areas where the disease now occurs to obtain or develop a source of virus-free buds.

The research in Brazil is of utmost importance to United States growers, points out Dr. J. R. Magness, head of the Division of Fruit and Vegetable Crops and Diseases. The disease known as "quick decline" in southern California is very closely related to tristeza. While it does not spread so rapidly, growers here are much concerned that it will wipe out all trees planted on sour orange rootstock. This would mean about a third of the plantings in Florida, about half of those in California, and nearly all in Texas. So far "quick decline" has not appeared in either Florida or Texas. Roguing the trees as soon as they become affected and replanting on resistant rootstocks are the measures now recommended to control quick decline.

The scientists believe it may be possible to obtain crosses between mandarins and sour oranges and between sweet and sour oranges and from this to develop a hybrid combining the characteristics of the sour orange, such as resistance to gummosis and foot rot, with the desirable tolerance to tristeza virus.

Plant Diseases Reported Systematically and Promptly

Because work of the Plant Disease Survey cuts across Division lines, it is well known to many Bureau and State scientists. Plant pathologists of the various crop divisions present their findings in the Plant Disease Reporter and in turn depend on this monthly mimeographed publication from the Survey to keep them informed on plant disease occurrence and control.

Before 1917 the information was collected in various sections of the Department and summarized annually in the Yearbook. Demand for systematic and prompt reporting of plant disease development led to the organization of the Plant Disease Survey, which, since 1923, has been combined with the pathological collections.

Except for short periods when for special purposes a small paid field staff of its own was authorized, the Survey has always depended on voluntary reports. The collaborators who form the mainstay of the reporting service are State plant pathologists.

Their reports are classified and filed in a permanent index, which constitutes a valuable historical record of plant disease occurrence in the United States. Plant disease literature from all over the world is indexed and filed separately. Staff limitations prevent this index from being as completely up-to-the-minute as could be desired. Even so, it is the best available starting point for any complete study of published work. Bureau pathologists are always welcome to use both these files.

The Plant Disease Reporter, now in its thirty-third volume, goes to more than 1,200 subscribers, including about 130 in foreign countries. Part of its outstanding usefulness lies in the speed of publication. No article judged suitable is held longer than 6 weeks. This permits the Reporter to serve as a forum for timely discussion of present and future pathological problems.

A separate series of Supplements to the Reporter is issued irregularly to take care of subject matter that can be presented more effectively as a unit. The 1949 series starts with Supplement 180.

Newest work in the Survey is the Crop Plant Disease Forecasting Project established in 1947 under the Research and Marketing Act. Designed to predict plant disease occurrence far enough ahead to allow advance planning for control, the Project provides for a cooperative warning service. Diseases now included are late blight of potatoes and tomatoes, tobacco blue mold, and cucurbit downy mildew. The research staff is studying spread and development of disease to discover fundamental interrelations that will permit the occurrence of critical factors to be foreseen as far in advance as possible.

Birdsfoot trefoil Strains Regionally Adapted

R. W. McKee, FC&D, points out that strains of birdsfoot trefoil for which seed is now on the market require different environmental conditions for top performance.

The broadleaf strains produced in New York and imported seed of broadleaf strains have given best results in the northern half of the United States. The narrowleaf strain produced in the West has been best on the irrigated lands of California.

Experimental demonstrations showing regional adaptation and forage value at Federal and State experiment stations have resulted in expanded use of the crop.

New Potato Varieties Take Lead

That 6 of the 13 leading potato varieties in certified seed stock production for 1949 plantings are introductions from the National Potato-Breeding Program is forceful evidence of the accomplishment in this cooperative research under the leadership of Dr. F. J. Stevenson, F&VC&D.

Well ahead of all potato varieties is Katahdin, with more than 13 million bushels of certified seed stock, or 27.5 of the total. This is about twice the certified seed production of the old stand-by, Irish Cobbler, now in second place. Katahdin was introduced in 1932. Its wide adaptation, disease resistance, and excellent market quality account for a steady rise in popularity.

While Chippewa, another of the six, has not increased in popularity so rapidly as Katahdin, it surpassed Green Mountain in the 1948 seed crop. Introduced in 1933, Chippewa has proved to be a more consistent yielder than Green Mountain and is earlier. It is immune to wild mosaic and net necrosis but is highly susceptible to leaf roll.

Sebago, released in 1938, is more resistant to late blight than the old commercial varieties but not nearly so resistant as some of the varieties released in the past 4 years. It also resists scab, mild mosaic, net necrosis, and yellow dwarf disease.

Further down in production rank among the new contenders come Pontiac, a late high-yielding red variety; Red Warba, a bud sport of Warba, early and high-yielding, and Red Pontiac (Dakota Chief) a deeper red than Pontiac from which it has mutated, but similar in other respects.

The Bureau's potato-breeding work began in 1910. It was reorganized as the National Potato-Breeding Program in 1929 with the active cooperation of the State experiment stations. Increased appropriations in 1948 have made it possible to organize research in every important potato-growing section of the United States. Up to now 31 new varieties have been introduced; 27 produced by crossing and selection and 4 have come from bud mutations.

Many of these new varieties will soon be replaced by even better ones as the breeding work progresses. Material is now available to give much wider combinations valuable in various regions. These include wide adaptation; high yield; early, medium, or late maturity; smooth desirable shapes; shallow eyes; high dry-matter content; and excellent cooking quality. In addition, seedlings are available that resist one or more of 13 parasitic diseases, including some of the virus diseases, and three insect pests. This material holds high promise for the potato varieties of the future.

Nelson Takes up Fiber Work at Beltsville

Elton G. Nelson, C&OFC&D, formerly in charge of flax investigations at the field station, Corvallis, Oregon, has accepted a position in Division work in fibers other than cotton at Plant Industry Station.

Mr. Nelson has just returned from an assignment with the State Department that last June took him to India and Pakistan for work on jute and other fibers. On his way home he consulted with government representatives and commercial fiber in France, Holland, England, Ireland, and Scotland.

Nematode Losses Reduced in Tobacco

Reviewing a three-way attack on the problem of nematode diseases in tobacco, F. A. Todd, TM&SC, notes several gains. Results of cooperative experiments at the McCullers Branch Experiment Station in North Carolina indicate that:

(1) Nematode damage can be reduced by various cropping sequences. Four-year rotations of cotton, corn, peanuts, and tobacco and 3-year rotations of peanuts, oats-weeds, tobacco, or corn, oats-weeds, and tobacco, or cotton, peanuts, and tobacco have been highly effective. Two-year rotations of peanuts and tobacco or oats-weeds, and tobacco have proved satisfactory. Winter cover crops of oats or rye increase the value of tobacco crops on infested land where they appear to reduce the nematode damage without actually cutting down the extent of disease.

(2) Either of two chemicals--ethylene dibromide or a mixture of dichloropropane and dichloropropene, known commercially as D-D--may be useful where soils are badly infested and crop rotation is not practical. Applications of ethylene dibromide (Dowfume W-40) at the rate of 20 gallons an acre or of D-D at the rate of 200 pounds an acre have reduced both root-knot and meadow nematode infestations and resulted in increased tobacco yields. There is evidence that the beneficial effects of these chemicals may last into the second season. Further study is needed, however, before these soil treatments can be generally recommended.

(3) From the breeding program comes a new family line, now in the third generation, that offers promise of combining nematode resistance with other desirable characters. Until this one, the strains with high resistance have had narrow, short closely spaced leaves that gave low yields and cured-out dark.

Research Program Paved Way

The wide and successful use of 2,4-D as a weed killer in the North Central States has a sound basis in the well-organized research-regulatory weed control programs in those States, notes Dr. L. M. Stahler, CC&D.

Speaking before a recent meeting of the Kansas State Weed Control Conference, Dr. Stahler estimated that about 12 million acres, mostly cropland, in that area were treated with 2,4-D this past year.

That no serious damage has occurred from indiscriminate use of the chemical, Dr. Stahler attributes to the State weed control programs organized in the 1930's after the Bureau had initiated cooperative weed research.

This work began paying off--even before the introduction of 2,4-D--in new methods for controlling bindweed, whitetop, and dogbane. Dr. Stahler comments that the farmers in Kansas, Nebraska, Minnesota, Iowa, and other States in the region now know more about the life history, hazards, and methods of controlling these pests than did any of the weed specialists 15 years ago.

"Blindness" in Iris Traced to Immature Bulbs

"Blindness" or failure of many blue bulbous or Dutch iris to respond to forcing this past season has been traced to immature bulbs. The finding comes from cooperative investigations by Dr. Neil W. Stuart at Plant Industry Station, the Northwest Bulb Growers' Association, and Dr. C. J. Gould at the Western Washington Experiment Station. The tests were fortunately in progress when florists began reporting serious difficulty with the problem. The blindness was especially severe, ranging from 30 to 100 percent, in plants from bulbs given cold-storage treatment to hasten flowering.

The scientists attribute the immaturity to the fact that the 1948 growing season in Washington State, where most of the bulbs are produced, was cooler and wetter than usual. Experiments showed that bulbs exposed to temperatures ranging from 75° to 85° F. for a period of 3 weeks following harvest and then precooled could be successfully forced for December and January bloom.

Further tests will be made to establish an accurate index of maturity and other requirements for after-ripening and precooling. Reports of this year's findings, however, will enable growers to plan to cure bulbs artificially before shipping them to the forcing areas. A record cold winter that has delayed the iris bulb crop by at least 3 weeks may result in the same difficulty this coming blooming season if the bulbs are not cured.

Seed of Purified Ladino White Clover Distributed

The first seed of purified Ladino white clover developed in an interagency project initiated and correlated by Dr. E. A. Hollowell, FC&D, has been distributed for foundation plantings in each of six Western States.

The composite seeds come from selections made and tested for true-ness to type by the Pasture Research Laboratory, the New Jersey Experiment Station, and the Central Experiment Farm, Ottawa, Canada. Eight State experiment stations cooperated in giving the selections preliminary evaluation tests.

Dr. A. L. Hafenrichter, chief of the Nursery Division, SCS, directed the work of vegetatively multiplying the plants. They were then transplanted to a 10-acre isolated area in Idaho for seed production.

It is hoped that larger quantities of seed will be harvested from this area in successive years to supply pure seed stocks to States interested in producing seed of Ladino white clover. In many of the seed-producing regions, Ladino white clover is being contaminated genetically by cross-pollination with common white clover and by mechanical mixtures from volunteer plants originating from hard seed of common white clover.

Gains In Renovating Pastures

The results of some of the pasture studies conducted cooperatively by this Bureau and BDI were discussed on "The National Farm and Home Hour" March 2 by R. E. Wagner, FC&D, and L. A. Moore of BDI.

These studies, begun at Beltsville in 1945, have shown remarkable increases in forage and milk production from renovating old run-down permanent pastures by disking or other cultivation, application of lime and fertilizer, and seeding high-yielding grasses and legumes.

Orchard grass and Ladino clover make the best mixture for reseeding in this area. One set of bluegrass and orchard grass-bluegrass pastures considered better than average was renovated in 1945, another set in 1946. Cows grazed on these pastures produced 2,150 pounds of 4 percent milk the first year, even though the pastures were out of production part of the first season. Milk yields were 5,200 pounds the second year, and 5,000 pounds the third. In comparison, yields from pastures that were limed, fertilized, and rotational grazed but not renovated were an average of only 3,500 pounds of milk. The renovation represented an increase of about 20 percent over the 3-year period.

Forage Legumes in Southeast Attacked by Sclerotinia

Stem and crown rot, Sclerotinia trifoliorum, is causing severe damage to forage legumes in the Southeast this spring, according to Dr. J. Lewis Allison and Dr. Camille L. Lefebvre, FC&D. The mild wet winter has favored development of the disease. The most severe attacks have occurred on alfalfa, crimson, red, and Ladino clover. The disease has been more destructive in fields where alfalfa followed or was preceded by a legume crop than where an interim has been allowed between these two crops. Late fall-planted legumes were more severely attacked than spring or late summer plantings. Commercial varieties of legumes in use throughout the region have shown little, if any, resistance to the disease.

Plan Research at New Potato Station

Research for improvement in potato production, marketing, and utilization was planned at a 3 day conference held recently at the new Potato Research Station, East Grand Forks, Minn.

R. B. Gray, D. F. Fisher, J. M. Lutz, Harold T. Cook, A. D. Edgar, G. B. Ramsey, A. H. Graves, and O. C. Turnquist represented the Bureau. Others taking part in the conference were representatives of the Minnesota and the North Dakota Agricultural Experiment Stations and Extension Services, the two State Seed Departments, the Red River Valley Potato Growers' Association, transportation agencies, and others interested in the potato industry of that region.

They mapped out a long-range program on breeding and other phases of production, improvement in harvesting and handling methods to avoid injury and deterioration, ways of utilizing low-grade stock and of improving the marketing of the better grades, and development of mechanical equipment for use in all phases of production, handling, and storage.

On the station staff, Dr. Lutz will direct research on harvesting and handling, Mr. Graves will be in charge of research on improvement of harvesting machinery, and Mr. Edgar will have direction of storage structure investigations.

New Findings from Winter Pasture Studies in South

The high value of vetch and oats for winter grazing crops in the South is shown in a 11-year study reported by J. L. Stephens and G. W. Burton, FC&D, at the Georgia Coastal Plain Experiment Station.

During the period vetch supplied 85 grazing days and produced 154 pounds of live weight gain per acre. Oats supplied longer grazing--89 days but not quite so much gain--115 pounds per acre. Rye and ryegrass supplied 59 and 52 grazing days, respectively, and 83 and 65 pounds gain.

The investigators find October 1 plantings have generally been best for winter oats. While seed treatment, crop rotation, and selection of disease-resistant varieties have reduced disease losses, no practical control has been found for aphid injury.

The study indicates that oats make little growth at mean monthly temperatures of 45° F. growth at 50° has been roughly one-third that at 55°.

Grain yields have not been reduced by moderate, continuous, or rotation grazing until February 1. They have been cut several bushels per acre by continued grazing until March 1. Yields were reduced too low to harvest for grain when grazing has continued until April 1.

Grain Storage Plans in Revision

The Division of Farm Buildings and Rural Housing has been asked by the CCC to assemble information needed in grain drying and storage problems for use during the coming summer and fall.

A list of 30 farm buildings for which plans will be needed has already been drawn up. This was done by a group representing the Division, the Grain Branch of FMA, and the Iowa, Illinois, and Indiana Experiment Stations at a work conference in Ames recently.

The list includes designs for buildings for temporary storage of ear corn, shelled corn, and small grain. Some of the structures provide for mechanical drying of ear corn or small grain. All of the buildings can be prefabricated either at the factories or at country lumber yards.

Plans are underway to revise publications issued in connection with the original ever-normal granary program. These give general requirements for grain storage, information useful to those planning to build or remodel storage structures, and instructions on insect control. The work of revising available plans and developing new designs will be divided among the three agricultural experiment stations and the Division.

Frozen-Food Locker Plants in Georgia

W. M. Hurst, MPFP, is joint author with H. D. White and W. E. Garner, agricultural engineers at the University of Georgia, of a report on frozen-food locker plants in Georgia, just published by the University. The bulletin offers suggestions on location, design, refrigeration, and processing equipment, on handling locker produce, and on reducing power and labor costs. It is based on an engineering study of 21 representative plants in the State.

Tree Breeding by Air Mail

World-wide airmail service will facilitate tree breeding, says G. F. Gravatt, FP, in the lead article in the January-February issue of Unasylva, a review of forestry and forest products published by the Food and Agricultural Organization of the United Nations.

For the past 2 seasons Mr. Gravatt has sent pollen from some of the Chinese hybrids and selected pure Chinese chestnut trees by air mail to Prof. A. Pavari at Florence, Italy. By using this pollen on bagged flowers of European chestnuts, Professor Pavari has obtained hybrid nuts both years. The viable pollen has given quicker results than nuts and scions in combining the desirable qualities of European chestnuts with selected trees from this country.

Mr. Gravatt points out that airplane transportation is not an unmixed blessing so far as better trees are concerned. It enhances the danger of spreading tree diseases from one country to another.

Pearson Studies at Oak Ridge

Dr. Robert W. Pearson, SM&I, Auburn, Ala., is among 32 scientists from this and several foreign countries enrolled in the seventh of a series of 1-month courses offered by the Institute of Nuclear Studies at Oak Ridge, Tenn.

The Institute, comprised of 19 Southern universities, conducts a broad program of research, training, and education in the nuclear sciences through a contract with the Atomic Energy Commission.

Dr. Pearson is a graduate of Mississippi State College and holds a PhD from the University of Wisconsin. He plans to use radioisotopes in fertilizer efficiency studies.

Begin Survey of Potato-Rot Nematode

Gerald Thorne and M. J. Fielding, at Salt Lake City, and W. D. Courtney, Puyallup, Wash. will represent the Bureau in a cooperative survey of eight, possibly nine Western and Northwestern States to determine the presence of the potato rot nematode (Ditylenchus destructor). Also cooperating in the survey will be workers from the experiment stations of the States concerned and BEPQ. This nematode is known to be a serious pest of the potato in seven European countries and Canada. So far, the only evidence of it to be found in this country was first discovered near Aberdeen, Idaho, in 1943.

New Agent Heads Potato-Breeding Work in Northwest

John G. McLean, formerly with the Kern County (Calif.) Seed Potato Association, has been appointed full time agent, F&VC&D, to cooperate with Idaho workers in developing potato varieties more resistant to diseases than the Netted Gem type now generally grown. The objective is to incorporate the market and cooking qualities and high yields of Netted Gem in a variety with resistance to leaf roll and verticillium wilt, which cause severe losses in the Pacific Northwest. Dr. McLean will be stationed at Aberdeen, Idaho. He will also be in charge of the cooperative breeding work in Washington, Oregon, California, and Utah.

Forage Specialist Retires After 43 Years of Service

Roland McKee, plant scientist responsible for the introduction and development of many of the new legumes now widely cultivated for forage in the United States, retired from the Bureau March 31 after more than 43 years of continuous service in the Department.

A native of Marysville, Kans., and a graduate of Kansas State College, Mr. McKee joined the Department as a scientific assistant in December 1905. For several years while stationed at the Plant Introduction Garden, Chico, Calif., Mr. McKee conducted research on forage and green manure crops adapted to the Intermountain and Pacific Coast States. He helped plan and make the first survey of foreign and domestic plants that could be used as green manure and then conducted research to determine the fundamental principles underlying the use of green manure crops in soil improvement.

For a period of 4 years after being transferred to Washington, Mr. McKee was assigned to the Division of Plant Exploration and Introduction and assisted in the direction of the work.

Since 1928 Mr. McKee has been in charge of a complex and far-reaching series of investigations of new species and varieties of leguminous crops for the Division of Forage Crops and Diseases. He has conducted studies in the breeding, adaptation, cultural requirements, and utilization of lespedeza, burclover, vetch, field pea, horse bean, and crotalaria for forage and green manure. He has also been instrumental in developing valuable new varieties of lespedeza, lupines, and vetch. These have greatly extended the areas in which the crops are adapted.

Mr. McKee is the author of nearly 100 publications on forage crops. Three of his recent works are the popular Farmers' Bulletins on "Vetch Culture", "Lupines", and "Lespedeza".

He and Mrs. McKee plan to move to California.

Deaths

Samuel Henry McCrory, who headed agricultural engineering work, now a part of this Bureau, from 1921 to 1940, died at his home in Washington, Feb. 18. A native of Iowa, a graduate of the University of Iowa, Mr. McCrory came to the Department in 1907. He retired in 1946.

While in service, Mr. McCrory initiated and guided a diversity of agricultural engineering achievements. Among these were the establishment of the first soil erosion experiment station at Guthrie, Okla.; use of snow surveys in western watersheds as a means of predicting water supplies for irrigation and power and for minimizing flood hazards; establishment of the farm tillage machinery laboratory at Auburn, Ala.; and development of cotton planting and ginning studies.

Crops Response to Phosphorus Studied in West

RMA funds have recently been allotted for an economic and agronomic analysis of crop response to phosphorus fertilizer experiments in Western States. Dr. Howard B. Peterson, SM&I, with headquarters at Fort Collins, Colo., will direct the project in cooperation with BAE and experiment stations in the States concerned.

A survey and summary of existing data is being made. Later investigations will seek answers to questions such as: (a) What quantities and types of phosphate fertilizers can be profitably used in areas served most economically through development of western phosphate deposits; (b) what additional production of individual crops and complete rotations will be made possible by using stated amounts of phosphate under different environments; and (c) how rapidly are available phosphates in the soil being used up.

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Departmental

Farmers Bulletin 1740 (rev.) Vetch Culture

Circular 625 (rev.) Birdsfoot Trefoil

Circular 797 Collecting Wild Potatoes in Mexico

Technical Bulletin 974 Yield and Composition of Cottonseed as Influenced by Fertilization and Other Environmental Factors

Miscellaneous Publication 658 Farmhouse Plans for Northeastern States

Miscellaneous Publication 98 (rev.) Market Diseases of Potatoes

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